

AS

Notice of Allowability

Application No.

09/995,618

Examiner

Henry S. Hu

Applicant(s)

SATO ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE of January 21, 2004.
2. ☒ The allowed claim(s) is/are 1-7.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in two telephone interviews with **Gerald M. Murphy, Jr. (Richard Gallagher) (tel. 703 205-8000) on February 12 and 13, 2004** to amend Claim 1 by correcting a typographical error:

Claim 1 at line 8 please replace "**CH₂=CH₂SiO-**" with "**CH₂=CHSiO-**".

DETAILED ACTION

2. Applicants' RCE and its amendment (received on November 26, 2003) filed on January 21, 2003 were both received.

Along with above two amendment, the limitation of **Claim 1** was amended to carry the specific limitation on silica filler with "**hydroxyl groups bound to silicon atoms on silica surfaces in said silica filler are linked to CH₂=CHSiO- or vinyl groups**" as well as

Art Unit: 1713

“replacing remaining hydroxyl groups with $(\text{CH}_3)_n\text{SiO-}$ groups”. The examiner confirms **the support for the amendment of Claim 1 regarding surface hydrophobizing on silica filler is on page 7 at line 3-22. Claims 1-7 are pending now. An action follows.**

3. Claim rejections under 35 USC 103 in the previous Final Office Action dated August 26, 2003 and Advisory Office Action dated January 12, 2004 are now removed for the reasons given in paragraphs 4-11 thereafter.

Allowable Subject Matter

4. Claims 1-7 are allowed.

5. The following is an examiner's statement of reasons for allowance: The above claims 1-7 are allowed over the closest references:

6. The limitation of amended parent **Claim 1** of present invention relates to *a curable fluoropolyether base rubber composition comprising:*

(A) 100 phr of a linear fluoropolyether compound containing at least two alkenyl groups in a molecule and having a perfluoroalkyl ether structure in its backbone.

(B) 10-40 phr of a silica filler having a specific surface area of at least $100 \text{ m}^2/\text{g}$, wherein hydroxyl groups bound to silicon atoms on silica surfaces in said silica filler are linked to $\text{CH}_2=\text{CHSiO-}$ or vinyl groups so that said silica filler has a vinyl content of 1×10^{-3} to 2×10^{-2}

Art Unit: 1713

mol/100 g, which silica filler has been surface hydrophobized by replacing remaining hydroxyl groups with (CH₃)_nSiO- groups wherein n is an integer of 1-3.

(C) an effective amount of an organosilicon compound having at least two Si-H groups each bonded to a silicon atom in a molecule, and

(D) a catalytic amount of a hydrosilylation catalyst.

See other limitations of dependent Claims 2-7.

7. In view of the Applicants' RCE amendment, parent **Claim 1** of present invention has been amended to carry the specific limitation for **surface hydrophobizing on silica filler** with “**hydroxyl groups bound to silicon atoms on silica surfaces in said silica filler are linked to CH₂=CHSiO- or vinyl groups**” as well as “**replacing remaining hydroxyl groups with (CH₃)_nSiO- groups**”.

With respect to 103 rejection for the Claims 1-7 on previous final rejection and advisory action, the primary reference **Tarumi et al.** only disclose **a curable fluoropolyether rubber composition** comprising (a) a straight chain fluoro-polyether, (b) a polytetrafluoroethylene, (c) an organohydrogenpolysiloxane, and (d) a hydrosilylation reaction catalyst, wherein the **components (a), (c) and (d) read on the components (A), (C) and (D) in claimed limitation.** Therefore, **Tarumi is silent about using surface-hydrophobized silica as filler.**

8. The **Tarumi** primary reference is **silent about using surface-hydrophobized silica as filler.** Although the secondary reference **Barthel et al.** have taught the preparation of surface-

Art Unit: 1713

hydrophobized silica can be rendering hydrophobic with an organosilicon compound to have a BET specific surface area of 40-450 m²/g with **formulas shown on column 3 at line 53 and 67** wherein the **R group may include alkenyl radicals such as vinyl or allyl** and its vinyl content is overlapping the claimed limitation **by examiner's calculation from example 2.**

In a close examination, the new scope of present RCE invention relates to a surface hydrophobized silica has been converted to a specified modified silica with the condition that a chemical bonding is existed between the silica surface and bonding agents containing vinyl, CH₂=CHSiO-, and (CH₃)_nSiO- groups. **Attention is on page 6 at lines 1-10 and page 15 at lines 33-34, only small organic compounds such as dimethyldichlorosilane and vinyl dimethylsilane are used to react with the surface of silica.** The key point is that Barthel uses only a vinyl dimethylsilyloxy-terminated polyorganosiloxane to modify a **hydrophobic filler** on the working example 2 (column 13, line 55 – column 14, line 5), while use a mixture of a vinyl dimethylsilyloxy-terminated polyorganosiloxane and hexamethyldisilazane to modify a hydrophilic silica as the control (column 14, line 6-36), an amount of such a coating of **“8 % by weight”** is thereby on the surface of silica (column 14, line 37-56).

9. This difference has been noted in an interview summary by the examiner that such a new amendment on surface hydrophobized silica may be different from Tarumi/Barthel since the surface modification on silica by Barthel is mostly **through physical trapping only to get a thick film with a reactive polymer rather than a traditional surface modification with trace amount of chemicals having a small molecular weight.** It should be also noted that some

Art Unit: 1713

vinyl group may be linked to Barthel's silica surface in the first layer. However, most of compounds are only physically coated outside the silica with a total of 8% by weight.

Furthermore, **a motivation is needed to combine such an additional and specific component, a surface-modified silica, to be included in Tarumi's curable fluoropolyether base rubber composition.**

Additionally, the present invention has shown in examples along with some comparative examples for unexpected results in obtaining a silica-filled, sulfur-vulcanizable rubber composition (see pages 15-18 for **example 1** along with its comparative control example 1, and **Table 1**). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

10. After further examination and search, the examiner found the following prior art did not teach the claimed limitation: **US No. 5,674,966 to McDermott et al.** only disclose the preparation of low molecular weight liquid injection molding resins having a high vinyl content (title). Wherein the high alkenyl content silicon resins of the specific formula are disclosed (abstract, line 1-3) by using small organic compounds such as vinyl dimethylchlorosilane and trimethylchlorosilane (column 13, line 57 –column 14, line 25). However, McDermott fails to teach or fairly suggest a curable fluoropolyether base rubber composition **by including other claimed components (A), (C) and (D) for a hydrosilylation.**

Art Unit: 1713

11. The two key issues, regarding the specific limitation for **surface hydrophobizing on silica filler** with (A) “**hydroxyl groups bound to silicon atoms on silica surfaces in said silica filler are linked to $\text{CH}_2=\text{CHSiO-}$ or vinyl groups**” as well as (B) “**replacing remaining hydroxyl groups with $(\text{CH}_3)_n\text{SiO-}$ groups**”, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

12. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, the independent and parent **Claim 1** is allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending **Claims 2-7** are passed to issue.

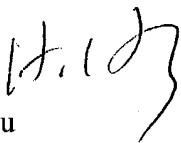
13. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is (703) 305-4918 and will be **(571) 272-1103 after December 22, 2003**.

Art Unit: 1713


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

February 13, 2004



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